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INSTITUTO POLITÉCNICO DE BRAGANÇA

Course Unit	Information and Communication Technologies in Education Sciences		Field of study	Information and Communication Technologies	
Master in	Science Education		School	School of Education	
Academic Year	2020/2021	Year of study	1	Level	2-1
				ECTS credits	10.0
Type	Semestral	Semester	1	Code	5016-627-1103-00-20

Workload (hours)	270	Contact hours	T	-	TP	36	PL	36	TC	-	S	-	E	-	OT	18	O	-

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s)	Manuel Florindo Alves Meirinhos

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Understands the need for, at current school, innovate pedagogically, the use of digital technologies.
2. Develops innovative teaching strategies promoting active methods through the use of ICT.
3. Conceived educational activities in digital format, appropriate to the level of cognitive development of students.
4. Integrates the teaching practice, learning platforms as a way to extend the classroom learning in a virtual environment.
5. Integrate into professional practice, emerging digital technologies.
6. Implement practical action projects, collaboratively, using educational resources to integrate into a learning context.

Prerequisites

Before the course unit the learner is expected to be able to:
Do tasks supported by basic ICT skills (writing a text and send it via email)

Course contents

Technology and innovation in education. Creation and educational exploration of multimedia educational resources. The pedagogical exploration platforms and web 2. 0 tools. Pedagogical exploration of emerging digital technologies. The implementation of practical action projects.

Course contents (extended version)

1. Technology and innovation in pedagogy.
    - The school facing the challenges of the digital society.
    - Use of versus ICT integration.
    - Levels of integration of ICT.
    - Concept and procedure of pedagogical innovation.
    - Integration of technological resources and associated skills.
    - Digital teaching competence.
2. Creation and educational exploration of multimedia educational resources.
    - Pedagogical exploitation of Internet resources.
    - Software educational open source with potential for learning science.
    - Edutainment, hard fun and gamification.
    - Software for development of activities (Jclic, Edilim, Ardora, Hotpotatoes).
3. The pedagogical exploration platforms and tools of web 2. 0.
    - Cloud computing.
    - The establishment of joint portfolios.
    - The joint debate on issues synchronously and asynchronously.
    - Development work together online.
    - Didactic exploration platforms.
4. Pedagogical Exploration of emerging digital technologies.
    - Mobile learning (tablets, smartphones, mobile phones) in the learning context.
    - QR Codes and Augmented Reality in science education.
    - Learnig Analytics.
    - The internet of things and artificial intelligence in the future of learning.
    - The emergence of Flipped classroom model.
    - Computational thinking: programming and robotics in science education.
5. The implementation of projects of practical action.
    - Identification of theme and of the requirements.
    - The project planning.
    - The development and implementation.
    - The evaluation of the project.

Recommended reading

1. Telefónica (2016). Prepara tu escuela para la sociedade digital. Claves para sumar-se al cambio. Madrid: Fundación telefónica.
2. Muñoz-Repiso, A. , & Martín, A. (2013). Recursos tecnológicos para la enseñanza e innovación educativa. Madrid: Síntesis.
3. OCDE (2010). Inspirados pela tecnologia, norteados pela pedagogia. Uma abordagem sistémica das inovações educacionais de base tecnológica. Santa Catarina: OCDE.
4. Comissão Europeia (2019). A Educação Digital nas Escolas da Europa. Relatório Eurydice. Luxemburgo: Serviço das Publicações da União Europeia.a el cambio educativo. Madrid: OEI-Fundación Santillana.
5. Lucas, M.; Moreira, A (2018). DigCompEdu: quadro europeu de competência digital para educadores. Aveiro: UA, 2018 Disponível em:https://area.dge.mec.pt/download/DigCompEdu_2018.pdf.

Teaching and learning methods

It promotes the establishment of an immediate relationship between theoretical knowledge and its application in practice. It is intended to direct contact with equipment and programs so that learners develop appropriate materials to their students and to apply them in concrete situations of learning.

Assessment methods

1. Continuous evaluation - (Regular, Student Worker) (Final)
    - Practical Work - 50% (Individual Skills Assessment Practice Test.)
    - Practical Work - 50% (Group work.)

Assessment methods

2. Exam Evaluation - (Regular, Student Worker) (Supplementary, Special)
   - Practical Work - 100% (Practical exam)

Language of instruction

Portuguese

Electronic validation

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01-12-2020	01-12-2020	02-12-2020	02-12-2020